



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/518,937	03/06/2000	Ajay Divakaran		8894

7590 12/12/2006  
Patent Department  
Mitsubishi Electric Information Technology Center  
America Inc  
201 Broadway  
Cambridge, MA 02139

EXAMINER

NGUYEN, MAIKHANH

ART UNIT	PAPER NUMBER
----------	--------------

2176

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/518,937

Applicant(s)

DIVAKARAN ET AL.

Examiner

Maikhanh Nguyen

Art Unit

2176

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

1. This action is responsive to communications: Amendment filed 09/21/2006 to the original application filed 03/06/2000.

Claims 1-13 are currently pending in this application. Claim 1 has been amended. Claim 1 is an independent claim.

### Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

*This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).*

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yeo et al.** (US 5,821,945, issued 10/1998) in view of **Boetje et al.** (US 6,049,332, filed 10/1996).

**As to claim 1:**

Yeo teaches a method for ordering multimedia content (*see the Abstract*), comprising the steps of:

- segmenting the multimedia content to extract objects (*col.2, lines 35-47*);
- extracting (*col.4, lines 62-col.5, line 2*) and associating features of the objects to produce content entities (*col.3, line 21-col.4, line 57*), wherein the content entities are recursive data structures comprising features (*col.9, lines 42-56*), relations (*col. 4, lines 30-35 and col.5, line 64-col.6, line 11*), directed acyclic graphs (*col. 3, line 30-col.4, line 58*);
- coding the content entities to produce directed acyclic graphs of the content entities (*col. 3, line 30-col.4, line 10*), each directed acyclic graph representing a particular interpretation of the multimedia content (*col. 3, line 25- col.5, line 52*);
- measuring attributes of each content entity (*col.6, lines 24-31*);
- assigning the measured attributes to each corresponding content entity in the directed acyclic graphs (*col.6,line 51-col.8, line 7*) to order the content entities of the multimedia content (*col.10, lines 19-32 & see figs. 4-5 and the associated text*).

Yeo, however, does not specifically teach “*containment sets and comparing the ordered content entities in a plurality of the directed acyclic graphs to determined similar interpretations of the multimedia content.*”

Boetje teaches containment sets (*col. 19, line 7-col. 20, line 64; and see figs. 9-10b and the associated text*) and comparing the ordered content entities in a plurality of the directed acyclic graphs to determined similar interpretations of the multimedia content (*col. 33, line 40-col. 34, line 62; and see figs. 22a-b and the associated text*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yeo with Boetje because Boetje's teaching would have provided the capability for identifying both visual and temporal relationships to allow the user to recognize the underlying story structure and navigate to the desired point in the video.

**As to claim 2:**

Yeo teaches the measured attributes include intensity attributes (*col.7, line 35-col.8, line 8*).

**As to claim 3:**

Yeo teaches the measure attributes include direction attributes (*col.7, lines 13-19*).

**As to claim 4:**

Yeo teaches the measured attributes include spatial attributes and the order is spatial (*col.9, line 42-col.10, line 7*).

**As to claim 5:**

Yeo teaches the measured attributes include temporal attributes and the order is temporal (*col. 5, line 65-col. 6, line 21 and col.9, line 42-col.10, line 7*).

**As to claim 6:**

Yeo teaches the measured attributes are arranged in an increasing rank order (*col.5, line 65-col.6, line 11 and col.10, lines 32*).

**As to claim 7:**

Yeo teaches the measured attributes are arranged in an decreasing rank order (*col.5, line 65-col.6, line 11 and col.10, lines 32*).

**As to claim 8:**

Yeo teaches traversing the multimedia content according to the directed acyclic graph (*col.3, line 24- col.4, line 10*) and the measured attributes assigned to the content entities (*col.6, line 24-col.8, line 7*).

**As to claim 9:**

Yeo teaches summarizing the multimedia content according to the directed acyclic graph (*col.9, lines 19-42*) and the measured attributes assigned to the content entities (*col.6, line 24-col.8, line 7*).

**As to claim 10:**

Yeo teaches the multimedia content is a three dimensional video sequence (*col.7, lines 12-19*).

**As to claim 11:**

Yeo teaches nodes of the directed acyclic graphs represent the content entities and edges represent breaks in the segmentation, and the measured attributes are associated with the corresponding edges (*col.5, lines 37-52*).

**As to claim 12:**

Yeo teaches at least one secondary content entity is associated with a particular content entity, and wherein the secondary content entity is selected during the traversing (*col.2, lines 35-48 and col.6, lines 1-21*).

**As to claim 13:**

Yeo teaches a summary of the multimedia is a selected permutation of the content entities according to the associated ranks (*col.9, lines 19-42*).

### Response to Arguments

4. Applicants' arguments filed 09/21/2006 have been fully considered but are not persuasive.
  - a. Applicant argues that *Yeo never orders different shots in a related sequence of shot using a DAG to provide a high-level interpretation of what is going on at a semantic level* [Remarks, 7].

In response, the Examiner respectfully disagrees. Yeo does teach the use of directed graphs to order video segments (*e.g., combines visual and temporal information to capture the important relations within a scene and between scenes in a video... Video shots are first identified and a collection of key frames is used to represent each video segment... A platform is built on which the video is presented as directed graphs to the user, with each category of video shots represented by a node and each edge denoting a temporal relationship between categories*) [see the Abstract].

- b. Applicant further argues that *Yeo does not describe the comparison of ordered content entities in a plurality of the directed acyclic graphs to determine a similarity of interpretations of the multimedia content* [Remarks, page 8].



In response, the Examiner respectfully submits that Applicant's arguments are substantially directed to the amended subject matter. The amended subject matter is addressed above with respect to the discussion of independent claim 1.

### Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Norton et al.            U.S. Patent No. 5,790,416            issued: Aug. 4, 1998
- Qian et al.            U.S. Patent No. 5,838,830            issued: Nov. 17, 1998
- Harel            U.S. Patent No. 5,873,081            issued: Feb. 16, 1999
- Qian et al.            U.S. Patent No. 6,002,803            issued: Dec. 14, 1999
- Eleftheriadis et al.    US. Patent No. 6,079,566            issued: Jun. 27, 2000
- Sezan et al.            U.S. Patent No. 6,236,395            issued: May 22, 2001
- Lennon et al.            U.S. Patent No. 6,516,090            issued: Feb. 4, 2003
- Y. Wang et al., "*Multimedia Content Classification Using Motion and Audio Information*," IEEE, June 9-12, 1997, Hong Kong, pp. 1488-1491.
- T. Zhang et al., "*Hierarchical Classification of Audio Data for Archiving and Retrieving*," IEEE, March 15-19, 1999, pp. 3001-3004.

Art Unit: 2176

- R. Lienhart et al., "*Scene Determination Based on Video and Audio Features*," IEEE, June 7-11, 1999, pp. 685-690.
- E. Wold et al., "*Content-Based Classification, Search, and Retrieval of Audio*," IEEE, Fall 1999, pp. 27-36.
- J.M. Gauch et al., "*Real Time Video Scene Detection and Classification*," Information Processing and Management, May 1999, pp. 381-400.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2176

### **Contact information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maikhanh Nguyen whose telephone number is (571) 272-4093. The examiner can normally be reached on Monday - Friday from 9:00am – 5:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Herndon can be reached at (571) 272-4136.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Any response to this action should be mailed to:**

Commissioner for patents  
P O Box 1450  
Alexandria, VA 22313-1450

Maikhanh Nguyen  
Examiner, AU 2176

*William G. Bashore*  
**WILLIAM BASHORE**  
**PRIMARY EXAMINER**